

Final Evaluation Report

for

A Pilot Study of Data Validation Techniques

for

Unemployment Insurance

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Final Evaluation Report for A Pilot Study of Data Validation Techniques for Unemployment Insurance

I. Pilot Study Objectives

A. Brief Pilot Study Summary

This report describes the final pilot study of a proposed approach for validating data that States submit on Unemployment Insurance reports. This data validation approach is designed to assess the accuracy and completeness of dozens of items that State Employment Security Agencies are required to submit to the U. S. Department of Labor. The data validated includes most items on 14 reports, and addresses unemployment insurance (UI) activities under both tax and benefits responsibilities of the States.

In November of 1997 three States—Massachusetts, Minnesota and North Carolina—came together to begin the new pilot study. The pilot study would provide a thorough test of the recently developed method to test the validity of monthly and quarterly reports. At this initial gathering, each state was given a state-specific validation handbook describing the entire data validation method and were given more than two days of training on how to use it. Training was offered to State staff who would conduct the validation and Department of Labor regional staff who would work with them during the study.

State staff then returned home and began the process of validating federally-reported unemployment insurance information. Separate teams reviewed UI benefits and contributions reports. The first stages of the project were largely the responsibility of automated data processing (ADP) staff. Following the instructions in the handbook, they developed and tested extract files that reconstructed the information for the federal reports. Validators then took over, checking whether the reconstructed data matched the official reports.

Pilot States shared information in four ways:

- they completed worksheets and spreadsheets documenting their findings;
- they explained their efforts to staff of an outside contractor who visited each state to review progress;
- they kept logs of the time they spent conducting data validation; and
- they prepared a report summarizing the pilot study results and made recommendations for refining the approach. The pilot ended when these reports were submitted in November 1998. State reports are included as Appendix B.

This report shares and analyzes the information assembled by the state and the evaluation Contractor.

B. Objectives

The proposed unemployment insurance data validation is very comprehensive, and as such could involve considerable investments as it is put in place. Before approving these investments the Department of Labor (DOL) chose to confirm the value of the data validation approach by conducting one last pilot study. The study had two objectives. The first objective was to confirm that the data validation process operated as designed, providing useful information on the validity of reported information. The Department would know the system was working as designed if:

- it provided an effective test of whether unemployment insurance reports were accurate;
- it clearly identified any important problems that existed;
- it could be completed with a reasonable level of effort.

This report shares the information from the pilot study on the type and number of validity problems found, and the costs involved in gathering that information. This should allow DOL managers to judge the reasonableness of adopting the proposed data validation system.

But while the project was testing whether the data validation methods were worth adopting, there was a working assumption that it would be adopted. Thus, a second objective of the project was to prepare for its possible implementation by:

- developing and testing training materials and curricula for State staff who would implement validation;
- accumulating examples of work products to be used in training;
- obtaining practical information on staff requirements;
- creating spreadsheets and other new mechanisms for recording results; and
- clarifying the practical steps States will need to go through to complete data validation in the future.

This report reviews findings regarding both the evaluation of data validation and the lessons learned that can facilitate future implementation. We have tried to write a concise report that addresses both objectives by:

- reviewing the ability of the validation approach to identify errors and confirm the validity of reports,
- projecting the costs of implementing and conducting the validation process, and
- documenting lessons learned about how best to implement the data validation system.

We begin with a brief discussion of the background of data validation in the unemployment insurance system and the pilot study through which it was tested (Section II). We then move on to a discussion of the pilot study's findings (Section III). The report closes with a discussion of practical lessons learned

(Section IV).

II. Background of Data Validation in Unemployment Insurance

A. Development of the Data Validation Approach

Unemployment insurance has long had a solid base of information on which it relied for program management. States report to the U.S. Department of Labor (DOL) on a monthly and quarterly basis under the Unemployment Insurance Required Reports (UIRR) system. UIRR data are used for economic statistics, to allocate Unemployment Insurance administrative funding based on State workload, to measure State claimant eligibility criteria and performance in providing benefits, and to account for fund utilization.

A general principle must be that performance and workload data will not support useful program decisions that lead to improved performance unless the data are readily available, valid, and consistent across States. The design of a comprehensive data validation approach and its testing through this pilot are necessary to ensure the accuracy of the UIRR data.

The Unemployment Insurance Service (UIS) first faced the problem of data validity in the 1970s, when an administrative funding initiative (cost model) was based on “workload counts” of State activities. Questions were raised about the fairness of allocating funding based on these counts at the same time that States were using different definitions for counting. To respond to these concerns, the Unemployment Insurance Service established the workload validation program to evaluate the accuracy of State-reported counts of specific unemployment insurance activities used to allocate national administrative funds.

In recent years the UIS has increased its emphasis on data validation through the UI Performs initiative. In 1992, the Government Performance Results Act required each agency to develop comprehensive performance measures and ensure data integrity. The UIS responded by launching an umbrella performance measurement system under the title, UI PERFORMS—a vehicle for continuously enhancing operational performance. The initiative seeks to coordinate many of the performance measurement efforts that have heretofore operated for different unemployment insurance programs, and with different management principles. Through this system DOL has sought to set clear priorities, to reward outstanding performers, and introduce information-based planning for improved programs. A key to the strength and acceptance of the UI PERFORMS system is confidence in the validity of the data used to calculate State performance.

In 1995, Unemployment Insurance began the development of a new validation methodology as part of the Performance Management Review System (PMR). This system, which evolved into the current data validation system for UI benefits, went beyond the workload validation items to validate almost all benefits reports cells. At about the same time, as part of the development of Revenue Quality Control, UIS funded another pilot study focused on data validation for contributions. The study documented the need and feasibility of a validation review for contributions reports. With this history, a data validation system based on the benefits validation approach was developed for contribution

reports. A third pilot test in three states refined the newer, contributions component of the data validation methodology.

During this sequence of studies every State was visited and given an opportunity to comment on both

benefits and tax validation systems. The materials were refined based on this information, and were well-tested in State-based pilots. Thus, by the time the present pilot study began, all components had been reviewed and tested by both State and Federal partners.

B. The Unemployment Insurance Approach to Data Validation

Approaches to conducting data validation vary widely depending on the information being reviewed and the use to which it will be put. All systems test the accuracy and completeness of reported information by asking questions such as whether:

- activities are regularly tracked and posted to data systems,
- such posting occurs in a timely fashion,
- data is recorded in conformance with official definitions and reporting rules, and
- activities are appropriately classified and compiled when producing reported counts.

As part of the process a review is conducted of source documentation as well as the procedures used to collect, record and tabulate the information on which reports are based.

The validation methodology tested in this particular pilot reconstructs, for each federal report cell to be validated, the count of transactions reported during a specific period. The reconstruction provides an audit trail to support and validate the counts and classifications that the State has reported.

The data validation methodology is structured around *modules* that organize the validation process, and *populations* that organize the data being validated. The modules used in data validation vary slightly between tax and benefits reviews, but their purpose is similar. They lay out the steps that should be followed to complete a thorough validation.

For example, Module 1 is the process that validates whether a State's programs for creating the federal reports are functioning correctly. The validator systematically examines files of the transactions included in federal report cells. Modules may be further refined into steps or sub-modules. There are three sub-modules within Module 1:

- module 1.1, Cell count reconstruction: compares the reconstruction counts with the counts in the corresponding federal report items.
- module 1.2, Duplicate detection: identifies duplicates in the reconstruction lists and eliminates them from the counts.
- module 1.3, Time lapse counts: checks that time lapse calculations used in the reconstruction are

done correctly.

The modules and sub-modules walk the State validation teams through the entire reconstruction and validation process. Of special importance is Module 3. While other modules are the same for each state, Module 3 has information that is specific for each State. For every data element used in reconstruction

of any of the dozens of report cells, Module 3 specifies how to validate that element in the State. It provides information including what the item is called in the State, in what data base it can be found, what its field name is in the data base, where the correct value can be identified on user inquiry screens, and any known problems with the State's definition of the item. The state-specific information guides State validation teams as they translate the general procedures of the national data validation program into specific procedures for their State.

Just as the data validation system organizes its process into manageable steps or modules, it organizes the data used for the reconstruction into manageable-sized *populations*. Each of the mutually exclusive populations defines a single type of data. For example, in tax validation, Population 3 includes all transactions that make a determination of the *status* of an employer regarding its liability for payment of unemployment insurance taxes. *Subpopulations* within status determinations further classify transactions by the type of determination made. Determinations that an employer is newly liable for coverage are placed in separate subpopulations from determinations that the employer is liable because it is a successor to a previously liable employer. The details of these populations are not important here, only that the populations and subpopulations divide the universe into manageable chunks that are easily compared to the items and counts on official reports. This is because the populations and subpopulations were created in a way that mimics the federal reports.

The data validation approach assumes a high level of automation in unemployment insurance data systems. Following the modular process, automated data processing (ADP) staff or programmers mine those data systems and produce extract files and other output that constitute the reconstruction audit trail. Then validators compare the reconstructed numbers that should have been reported to the values that appear on the official reports. They identify any differences and present their findings in standard formats.

Reflecting the study's first objective, there are two evaluation questions that must be answered to know whether this validation approach should be adopted: does this process ensure adequately valid data, and can it do so at a reasonable price. The remainder of this report answers these questions, and also offers some practical advice on the implementation of data validation systems for unemployment insurance.

III. Detecting Errors

This section of the report looks at the errors detected in the three pilot States with an eye toward understanding the workings of the data validation methodology. The section is organized around

questions managers might ask before implementing the data validation methodology.¹

To preview the results—the data validation system identified problems that exist in State unemployment insurance reports confirmed the validity of data that had no problems. The types of problems identified

by the data validation system can be corrected by State staff. The resolution of these problems can demonstrably improve the accuracy and comparability of the information States submit on their UI reports. The details follow in the response to questions.

Is the proposed data validation approach a fair and effective mechanism for assessing reported data?

Issue: Is the data system as designed one that will convince knowledgeable users that their reports, and those of States to whom their performance will be compared, are judged fairly and effectively.

Evidence: This is a difficult question to answer absolutely. To truly assure ourselves that the system is effectively identifying all errors we would need to know all problems that exist. Of course we do not know the type or number of errors that data validation did not find. So we will never know for sure whether we have detected most of the problems or only a few.

However, the methodology *is* designed to be thorough and comprehensive and to detect any serious errors in federal reports. It is not designed to ensure that the reports are 100% perfect. As in the old joke, perfection costs extra.

The historical development of this methodology gives us some assurance that it meets the basic standards of comprehensiveness and accuracy. The current version builds on three development projects where the system received successively more thorough tests. As part of those projects every State in the country was given an option to comment on the logic and design of the method. The final version also benefitted from detailed recommendations from U. S. Department of Labor staff. This extensive design process with input from all customer groups, assures a basic level of completeness and reasonableness. But there is also evidence that the validation system works in practice as planned in theory.

The best judges of the system's fairness and effectiveness are the staff of the three pilot States who used the data validation methodology. These people are intimately familiar with their data systems' strengths and weaknesses, and will have the burden of explaining and correcting any errors found. These key customers, who will be most affected by the system, surely would have told us if they felt the approach was unfair, if it focused on the wrong issues, if it was inefficient, or if it missed key threats to validity.

¹ Although results in this report are drawn from the experiences of three pilot States, we are not attempting to assess the performance of these States. We greatly appreciate the assistance of these pilot States. They provided examples and illustrated general principles that apply to all States.

The pilot States reported that the system is valid, accurate, efficient and more comprehensive than prior validation systems they have used. The three States participating in the study—Massachusetts, Minnesota and North Carolina— wrote:

“We have no doubt that Data Validation will improve the quality of the data we report ... We are very confident that national implementation of Data Validation will improve the integrity of data reported by other States.” (NC)

“Minnesota considers the UI Data Validation methodology to be very efficient and a major improvement over our current validation process.”

“The new validation methodology is very comprehensive and truly validates the accuracy of the data used by the State to create federal reports ... we found several reporting inconsistencies that would not have been detected through any other method.” (MA)

Conclusion: End users find the data validation methodology to be fair and effective.

Is the system comprehensive?

Issue: Is the data validation methodology able to validate the full range of information reported to DOL and used in performance measurement.

Evidence: The system validates a wide range of items from both benefits and contributions reports. Tables 1A (benefits) and 1B (tax), at the end of this section, list all report items for which a determination of validity is made. The determination is either that the item passes and is considered valid, or that it fails because the difference between the number on a report and its validation or reconstruction count is greater than 2 percent. The list in the two tables includes 82 items from 19 different populations. The pilot demonstrated the system’s ability to successfully produce scientifically sound judgements of validity in each area.

A. Additional Validity Assessments

The large number of validity judgements completed by the pilots and listed in Tables 1A and 1B affirm the breadth of coverage. But in several ways, even this long list dramatically understates the number and types of information for which the system provides information on validity. The following example illustrates this point.

Population two for benefits validation includes data elements related to final payments. A pass/fail judgement is made on only two items, one of which is the total number of payments reported on the ETA 5159 report. However, on the reports completed at the end of the validation process this item is divided into four component data elements, each of which represents a sub-portion of the total (payments in UI, UCFE, UCX, and workshare). Each of these four items is actually a separate cell on the 5159 report. For each, the validation process performs a comparison of the reported value against a validation count, and the State is told the percent by which the number on the official report is too high

or too low. The only thing missing for these finer divisions is the formal pass/fail designation.

The pass/fail judgement is reserved only for the total because the validation approach stresses precision. The threshold for the pass/fail judgement is quite stringent. If a reported number is off by as little as 2 percent it will fail. Because this is such a narrow window, the validation methodology makes every attempt to produce the most precise validation count possible before making a final judgement on validity. One part of this effort is to test whether there are duplicates being counted and to eliminate them from the reconstruction count that validation uses to test report accuracy. Duplicate detection is only practical to do for the total, so only at the total level is it possible to make a pass/fail decision.

If we include all items for which a comparison was made between a validation count and a report item, the breadth of coverage is actually far more comprehensive than simply the 82 pass/fail items. During the pilot study the validation method was able to compare an official report value to a reconstruction value for 293 report items in addition to the 82 listed in Tables 1A and 1B.

Although these comparisons may lack some precision, there is often enough information to make useful policy judgements regarding validity. In our example, if final workshare payments were off by 30 percent, the State could be sure the reported value was off by more than the threshold of 2 percent. Even were we able to make an adjustment for duplicates the error rate is not likely to drop from 30 percent to less than 2 percent. Using the information from data validation, a State could safely proceed to treat the population as if it had failed and make necessary corrections. We recommend that this follow-up procedure be built into future versions of the validation methodology.

Recommendation: We recommend that a pass/fail judgement be made on most report items for which validation testing is done. Of course for data items that were validated with less precision—no duplicate detection, no separate sample—the thresholds might have to be loosened in two ways:

- to be confident that the two percent threshold of error had been exceeded validators might want to see an error of 10 or 20 percent. The exact level would have to be set on the basis of statistical and policy analyses. But there will be some level of error that is high enough that, even with a less precise measure, we could be confident that the true error was at least 2 percent.
- some smaller data items can have a very small number of transactions. It is not unusual to see less than 50 transactions or entities reported in a single data item. Cells that represent a very small portion of a larger reporting population probably should not receive a formal pass/fail evaluation.

There is another sense in which the validation information is more comprehensive than the 82 pass/fail items. For many of those 82 items there is additional information that can help isolate the reason an item fails, thereby helping States seek a solution. Another example will illustrate this. In one of the pilot States, the reported data failed the validity test for overpayments case aging, which is the sum of several finer data elements. Looking at the cells upon which the total was based, it was clear that almost all the aging problems were related to UCX/UCFE claims with almost none from regular UI. As in this example, information provided by the data validation approach is frequently comprehensive enough to help find the solution, not just the problem.

One final point about comprehensiveness addresses the process itself rather than the number of items

reviewed. The variety of review methods—reconstruction counts, samples, sorts, duplicate detection and quality reviews—requires States to engage each report item through a comprehensive validation, to look at it from different angles and at different levels of detail.

The comprehensive, detailed nature of the review forces States to look at their data more closely than they normally would. This leads them to spot problems even before the validation is complete or to find problems in addition to those for which validation routinely checks. The following example illustrates this point.

A field audit supervisor in tax was reviewing the printout of a validation reconstruction files. She noticed an overly large number listed for wages reviewed by a particular audit. This prompted her to review the original audit case file. There she found that wages that were earned in another State were inadvertently recorded on the audit as wages earned in her State. This was an error that the State's routine quality

control reviews would normally check. With this finding she was able to re-emphasize the importance of maintaining those procedures. In this example the advantage of a comprehensive review is that it forces States to pay attention to data that otherwise would pass by unnoticed. States can detect and correct system flaws including some that data validation is not intended to check.

Conclusion: The validation methodology is comprehensive in the large number of reports and items it validates. The pilot demonstrated the ability of the system to effectively validate each of those items.

Does the data validation methodology find errors? Are there errors to be found?

Issue: The validation approach may be extremely comprehensive, but it would be of little value if it did not find errors when they existed. Then the comprehensiveness would become a disadvantage, adding considerable effort to no productive end.

A related issue is whether there are errors to be found. If State data systems are known to be relatively error free, it would not be reasonable to expend considerable effort chasing problems that do not exist.

Evidence: The pilot confirmed that there are validity problems and the data validation system finds them. Look again at Tables 1A and 1B. Each validity decision for each State has been classified by one of the following letter codes:

- F - Fail; there is a discrepancy of more than 2 percent between the number on the official report and the number validation identifies as correct.
- P - Pass; the reported count and the validation count are identical.
- PwE - Pass but with errors; the report number and its validation reconstruction do not match exactly, but any difference between the two is less than 2 percent.

When occurrences of these three results are counted across the 59 benefits data validation items:

- 25 percent of the items were failed by at least one of the States (at least one F);
- 35 percent of the items were passed by all three States (all P); and

40 percent saw no State fail, but had at least one State pass with some small errors (some PwE)²

Conclusion: Although overall this is a picture of data systems that for the most part are producing accurate data, there are many problems to find and the validation process clearly finds many.

Can or should the problems be fixed?

Issue: Finding problems is not especially helpful if those problems cannot be corrected. In prior data validation studies we have done, some States have noted that valid problems can be intractable for

several reasons:

- they may be too expensive to fix,
- the fix would require a major redesign of automated data systems,
- the problem reflects a conflict between State and federal rules, or
- the magnitude of the problem is so small it is not worth fixing.

Evidence: In their end-of-project reports, two States discussed the specific problems they found. Massachusetts provided a list of 12 errors in benefits reporting and North Carolina listed seven. According to the States all of these problems have either been corrected or a specific fix is planned.

Information from tax is a little more preliminary. One state validated only a single population, and a second had not fully completed validation at the time the pilot study ended. In the third state a small number of problems were found. All but one have been corrected and there are plans to correct this last reporting problem. It is interesting to note that by correcting reporting problems, this state is now able to take credit for activities that had not previously been counted on their ETA 581 reports.

Conclusion: The validation methodology has demonstrated that it can serve as a basis for improving the validity of reports. Thus the validation approach appears not only to find problems, but also to facilitate solutions.

Is the validation effort worth its cost?

Tables 1A and 1B follows. These tables list all pass/fail validity judgements from the study. Turn to page 22 for a discussion of costs.

² Similar analysis could not be done for the tax items. One of the pilot States did data validation only for one of five populations. Another was still completing the validation when the report was submitted. The latter State had a high level of reported error, but some of that will likely diminish once their validation procedures are refined further.

TABLE 1A
Errors Detected by Data Validation
Benefits

(Legend: **P**=Pass with no errors detected. **PwE**=Some errors detected but fewer than 2% of transactions. **F**=Failed, >2% Errors)

Validation Item	States		
	Massachusetts	Minnesota	North Carolina
Population 1 Weeks Claimed			
1. Total Weeks Claimed	P	PwE	P
Notes		<1%, cumulative result of errors in 6 items	
Population 2 Final Payments			
2. ETA 218: By Weeks of Duration	PwE	Not Available	PwE
Notes	<1% off		1) Payments with weeks>25 exceeded 2% error 2) Weeks<25 & average weeks had smaller errors
3. ETA5159: By Program Type	PwE	PwE	P
Notes	<1% difference	<1%, small errors in each cell with reported #'s	

Validation Item	States		
	Massachusetts	Minnesota	North Carolina
Population 3 Claims and Claims Status			
4. New Intrastate (5159)	PwE	PwE	P
Notes	Negligible errors	<1%	
5. Additional Intrastate (5159)	P	PwE	P
Notes		just<2% over-reported	
6. Filed from Agent (5159)	P	P	P
Notes			
7. Taken as Agent (5159)	P	PwE	P
Notes		just<2% under-reported	
8. Transitional (5159)	P	PwE	P
Notes		<1%	
9. Received as Liable (5159)	P	F	P
Notes		8% over-reported	
10. UI, Self employment (5159)	P	P	P
Notes			
11. New CWC Total (5159)	F	F	P
Notes	8% under-reporting driven by 24% under on new interstate	25% over-reported, with all error in new intrastate CWC	
12. New CWC BY Total (586)	F	F	P
Notes	31% under-reporting	31% over-reporting	

Validation Item	States		
	Massachusetts	Minnesota	North Carolina
13. Insufficient Wage Credits (218)	P	F	PwE
Notes		7% over-reporting	Report count high by<1%
14. Sufficient Wage Credits (218)	P	PwE	PwE
Notes		minimal	Report count high by<1%
15. Total Benefit Years Established (218)	P	PwE	PwE
Notes		minimal	Report count high by<1%
16. Maximum WBA (218)	P	PwE	PwE
Notes		minimal	Report count high by<1%
17. Maximum WBA and Duration (218)	P	PwE	PwE
Notes		minimal	Report count high by<1%
18. Potential Duration ≤25 wks. (218)	P	P	PwE
Notes			Report count high by<1%
19. Potential Duration>25 wks. (218)	P	PwE	PwE
Notes		minimal	Report count high by<1%
20. Workshare Total (5159)	P	PwE	P
Notes		Just<2%, small numbers	

Validation Item	States		
	Massachusetts	Minnesota	North Carolina
Population 4 Payments			
21. Total First Payments (9050)	P	PwE	F
Notes		minimal	100% over-reported
22. Total - Time Lapse (9050)	P	Not Available	P
Notes			
23. Partial/Part Total first Payments (9050)	P	PwE	P
Notes		minimal	
24. Partial Payment Time Lapse (9050)	P	Not Available	P
Notes			
25. Total Weeks Compensated (9051)	P	PwE	F
Notes		minimal on all subitems	95% over-reported
26. Total Weeks - Time Lapse (9051)	P	Not Available	P
Notes			
27. Partial/Part Tot. Wks Compensated (9051)	P	PwE	F
Notes		minimal on all subitems	100% Over
28. Partial Weeks Time Lapse (9051)	P	Not Available	P
Notes			
29. Total Weeks Compensated (5159)	F	PwE	P
Notes	4% under-reported	5 subitems over2%	
30. Total Weeks - Dollars (5159)	P	PwE	P
Notes		2 subitems>2%	

Validation Item	States		
	Massachusetts	Minnesota	North Carolina
31. Total Weeks - Time Lapse (5159)	P	Not Available	P
Notes			
32. Interstate CWC Total (586)	F	F	P
Notes	76% under-reported driven by 6 data items off by>50%	by .02%	
33. Interstate CWC- Dollars (586)	F	PwE	P
	0 reported	1.4%	
34. Interstate CWC- Time Lapse (586)	P	Not Available	P
Notes			
35. Workshare (5159)	P	F	P
Notes			
36. Workshare - Dollars (5159)	P	P	P
Notes			
37. Workshare - Time Lapse (5159)	P	Not Available	P
Notes			
Population 5 Nonmonetary Determinations			
38. Total Determinations (207)	P	PwE	P
Notes		3 subitems>2%	
39. Total Determinations -Time Lapse	P	Not Available	P
Notes			

Validation Item	States		
	Massachusetts	Minnesota	North Carolina
40. Total Determinations (9052)	P	PwE	P
Notes		no subitems>25 error	
41. Total Determinations/Time Lapse (9052)	P	Not Available	P
Notes			
42. Sep/Non Sep Determinations (9053)	P	PwE	P
Notes		all errors MC labor Not Available	
43. Determinations-Time Lapse (9053)	P	Not Available	P
Notes			
Population 6 Lower Authority Appeals Filed			
44. Total Appeals (5130)	P	Not Available	PwE
Notes			Approx. 1% under-reported
Population 7 Higher Authority Appeals Filed			
45. Total Appeals (5130)	PwE	Not Available	PwE
Notes	<1% in part due to offset of over/under-reporting		< 1% under-reported
Population 8 Lower Authority Appeals Decisions			
46. Total Decisions (5130)	P	Not Available	P
Notes			
47. Total Decisions - Time Lapse (5130)	P	Not Available	P
Notes			

Validation Item	States		
	Massachusetts	Minnesota	North Carolina
48. Total Decisions (9054)	P	Not Available	PwE
Notes			1/5th under-reporting interstate
49. Total Decisions - Time Lapse (9054)	P	Not Available	P
Notes			
Population 9 Higher Authority Appeals			
50. Total Decisions (5130)	P	Not Available	P
Notes			
51. Total Decisions - Time Lapse (5130)	P	Not Available	P
Notes			
52. Total Decisions (9054)	P	Not Available	P
Notes			
53. Total Decisions - Time Lapse (9054)	P	Not Available	P
Notes			
Population 10 Lower Authority Appeals Aging			
54. Total Aging	P	Not Available	P
Notes			
Population 11 Higher Authority Appeals Aging			
55. Total Aging	PwE	Not Available	P
Notes	1.3% over-reported		

Validation Item	States		
	Massachusetts	Minnesota	North Carolina
Population 12 Overpayments Established			
56. Overpayments Established (227)	P	P	F
Notes			7 of the cells contributing to the total have variances from 6-42%
57. Overpayments Established - \$'s (227)	P	P	PwE
			Minimal differences
Population 13 Overpayments Reconciled			
58. Overpayments Reconciled (227)	F	P	F
Notes	No report for many cells		43% over reported Overpayments reconciled cash not reported
59. Overpayments Reconciled - \$'s (227)	PwE	F	P
	minimal		
Population 14 Overpayment Case Aging			
60. Overpayment Case Aging (227)	F	P	F
Notes	under-reported 49%		Under-reported 47 percent Large errors in UCX/UCFE counts

TABLE 1B
Errors Detected by Data Validation
Contributions
(from ETA 581 report)

(Legend: **P**=Pass with no errors detected. **PwE**=Some errors detected but fewer than 2% of transactions. **F**=Failed, >2% Errors)

Validation Item	States		
	Massachusetts	Minnesota**	North Carolina
Population 1 Active Employers			
61. Total Active Employers	Not Available	PwE	P
Notes	Massachusetts completed only population 5	minimal	
Population 2 Report Filing			
62. Reports Filed	Not Available	F	P
Notes			
Population 3 Status Determinations			
63. Total Determinations	Not Available	F	P
Notes		12% under-reported	
Population 4 Accounts Receivable			
64. Receivables Established - Cont.	Not Available	F	P
Notes		MN did not complete this population, all failures here are by large amounts, but must be considered preliminary.	

Validation Item	States		
	Massachusetts	Minnesota**	North Carolina
65. Receivables Liquidated - Cont.	Not Available	F	P
Notes			
66. Declared Uncollectible - Cont.	Not Available	F	PwE
Notes			
67. Receivables Removed - Cont.	Not Available	F	P
Notes			
68. End-of Quarter Balance - Cont.	Not Available	F	P
Notes			
69. Receivables Established - Reimb.	Not Available	F	P
Notes			
70. Receivables Liquidated - Reimb.	Not Available	F	P
Notes			
71. Declared Uncollectible - Reimb.	Not Available	P	P
Notes			
72. Receivables Removed - Reimb..	Not Available	F	P
Notes			
73. End-of Quarter Balance - Reimb.	Not Available	F	P
Notes			

Validation Item	States		
	Massachusetts	Minnesota**	North Carolina
Population 5 Field Audits			
74. Total Audits	P	F	P
Notes		Under counted by 1/3	
75. Total Wages Pre-audit	P	F	P
Notes		under-reported 20%	
76. Total Wages Post-Audit	P	F	P
Notes		under-reported 20%	
77. Total Wages Under-reported	P	F	P
Notes		over-reported 78%	
78. Total Wages Over-reported	P	F	P
Notes		under-reported 90%	
79. Taxable Wages Under-reported	P	F	P
Notes		under-reported 10%	
80. Taxable Wages Over-reported	P	F	P
Notes		over-reported 55%	
81. Contributions Under-reported	P	F	P
Notes		over-reported 52%	
82. Contributions Over-reported	P	F	P
Notes		under-reported 39%	

IV. The Cost of Conducting Data Validation

In order to institute a nationwide measurement system the Department of Labor needs to understand the resources that the system will require both for development and for ongoing operation. In a system of this type, the primary resource required is staff time—automated data processing staff to extract information from State data systems and assemble it in a form that facilitates review, and validators to conduct the reviews of those data. Thus, this section focuses primarily on the time it took pilot State staff to complete the data validation activities. At the end of the section we identify other costs which, though small relative to staff costs, need to be considered when planning for implementation.

A. Staff Time

The overall finding is that either the *initial* tax or benefits validation can be largely completed with one full-time staff equivalent. As other States begin to set up their initial data validation systems, we believe that they will be able to complete most of their work if they plan for the equivalent of two staff people divided across the tax and benefits validation team. Within each team, staff resources will be split across programmers, system analysts, managers, and validators. But, again, a reasonable planning assumption is that in total initial data validation can be completed with *approximately* two full time staff equivalents.

Remember that this is the effort required to develop the data validation system. In future years, once computer programs are in place, the time required should be far less.

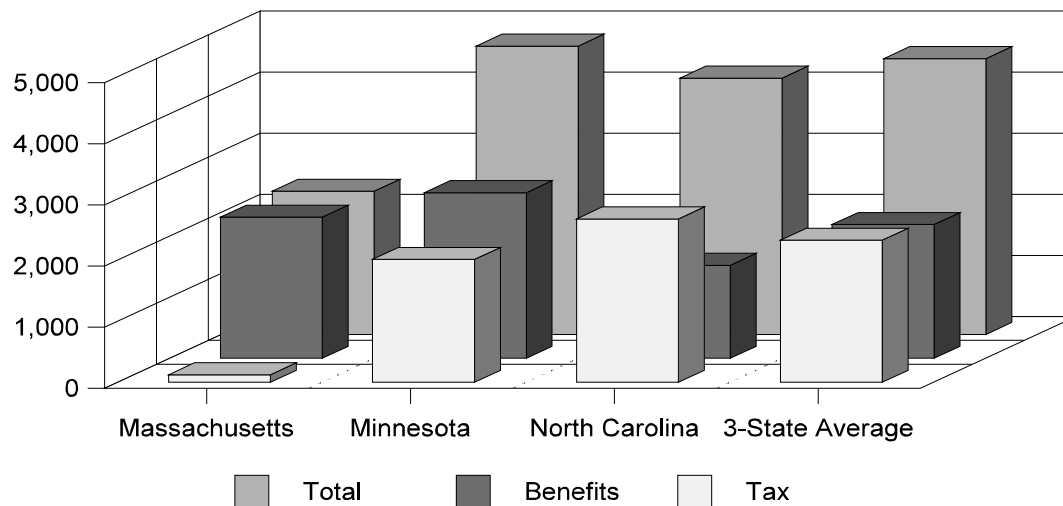
This section will briefly review the time it took the pilot States to complete their data validation work. We will break the information out separately for tax and benefits. Within each area we will further divide time by type of task, and validation population.

Overall staff time

On average across the three pilot States it took 2,190 hours to complete the validation of benefits reports.³ This includes time for preparation, meetings, data processing, validation and preparation of reports on findings. The time to complete validation varied considerably from State to State. North Carolina took the least time—1,522 hours, and Minnesota the most—2,709 hours. Minnesota is really a special case. They had begun a voluntary test of the validation methodology well before the pilot project began. Once they were selected as a pilot State they picked up where they left off. The time they reported for the study included work done during both the voluntary and the official pilot. They estimate that had they done all the work as a single, more coherent project they could have completed the validation of benefits reports in 2,200 hours. Had they done this the three-State average for benefits would have been reduced to 2,011 hours.

³ Not all States completed validation of all populations. For benefits, Minnesota did not complete appeals. For tax, Massachusetts validated only reports on field audits. y When computing national averages, the time spent by these States was included only to calculate the average time for the populations they completed.

Chart 1: Time Required to Complete Data Validation



Time Required to Complete Data Validation

	Massachusetts	Minnesota	North Carolina	3-State average
Total	2,342	4,718	4,194	4,514
Benefits	2,310	2,709	1,522	2,190
Tax	122	2,009	2,672	2,324

Tax validation took an average of 2,324 hours to complete. This number is based primarily on the two States that attempted to complete validation of all five tax populations. Data from Massachusetts were used only to adjust the average for field audits, the population they completed, and report preparation.

The experience of North Carolina illustrates how the time it takes to complete the work can be affected by issues outside the core data validation design. Shortly before the State volunteered for the pilot they had completed a comprehensive review and update of the automated procedures they used for benefits reports. When the pilot began, ADP staff who had worked on the system revisions were assigned to the data validation project. As they began that project, they knew where to find most of the data items they needed for the pilot and were able to move ahead quickly with their work.

By contrast the programmer who knew where all the data could be found on the tax automated

system was busy on another project when the pilot began. The person assigned to the pilot project was new to the tax data processing unit. At first he was asked to work alone, trying to juggle the many tasks data validation requires. Though he worked hard and conscientiously, he was working at a disadvantage and, inevitably, made several false starts. The project tasks moved more quickly once managers intervened to assign a more complete complement of programmers. In part because of the early staffing problems, North Carolina took more than 1,000 hours longer to complete data validation for tax than it did for benefits.

A related story was told by Minnesota. In their final report they wrote:

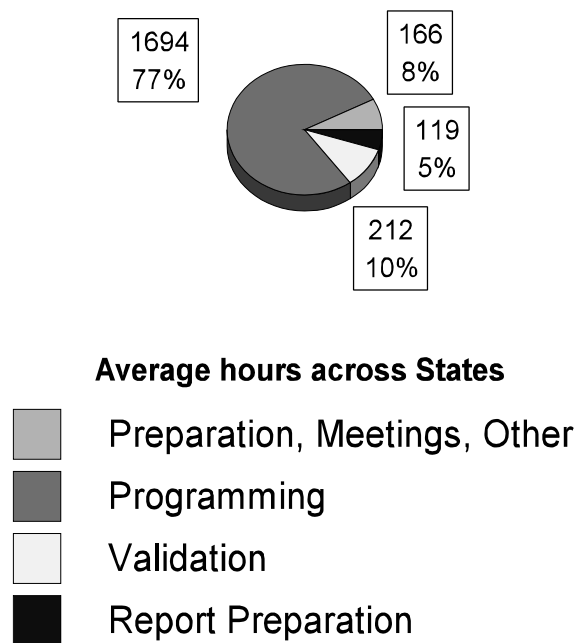
“Our tax contribution system was designed in 1975 and, although improvements were added to the system over the years, the basic file structure is unchanged. Most of the elements [federal reports require for] accounts receivable were introduced after this time. We knew in developing the data for the ETA 581 that we could not produce 100% accurate data because of the limitations of our system. ... In developing the method to do the data validation we established many new data tables to store critical data elements for each of the populations and sub-populations contained in the manual. However, the problems mentioned above combined with confusion caused by the terminology in the manual, prevented us from becoming thoroughly confident in the data.”

There is a lesson here for future attempts to implement data validation. States using less experienced staff and more outdated data systems risk taking considerably longer to complete data validation than do their counterparts who do not face these obstacles. They would benefit from early technical assistance so they do not fall behind schedule and become discouraged.

Staff Time by Function

Initial data validation development is heavily dependent on the efforts of automated data processing staff. On average across the three States, 77% of the time spent on data validation of benefits reports was devoted to programming (1,628 out of 2,116 hours). Far less time was spent on preparation and meetings (127 hours), validation (186 hours) and preparation of reports (178 hours). Here report preparation means both the completion of spreadsheets reporting validation findings, and preparation of the narrative final report each state submitted at the close of the pilot study.

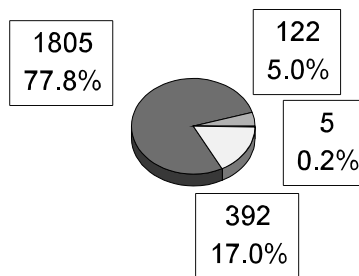
Chart 2: Benefits Time Distribution



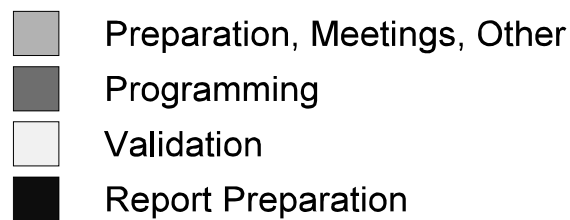
Benefits Time Distribution	average hours across States	%
Preparation, Meetings, Other	166	8%
Programming	1694	77%
Validation	212	10%
Preparation of Reports	119	5%
Total Hours	2190	100.0%

A similar story is told by the reports States have provided regarding the time they spent on validation of unemployment insurance tax reports. There 78 percent of the time was spent on programming. When compared to benefits validation of the reconstruction files took a greater portion of staff time.⁴

Chart 3: Tax Time Distribution



Average hours across States



Tax Time Distribution	average hours across States	%
Preparation, Meetings, Other	122	5.0%
Programming	1805	77.8%
Validation	392	17.0%
Preparation of Reports	5	0.2%

⁴ Given the very small amount of time listed for report preparation we suspect that States had a difficult time distinguishing the time they spent validating and the time they spent entering the results of validation onto reports.

⁵ We should be clear about what we mean by validation and programming in these charts. Programming is time spent by ADP staff to extract data from the States unemployment insurance automated data bases. Also included in programming hours is the time staff spend creating output files in the format required by the data validation handbook. Validation, in these charts, refers only to the time reviewers spend examining the products of programming (e.g. sort printouts) to assess whether the data is valid.

Total Hours	2340	
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One way of interpreting the amount of time used during the pilot is to say that most of the time is devoted to one-time start-up costs. This is because once developed, the computer programs do not all need to be recreated for the next round of data validation. Once ADP staff have completed their programming, the code and procedures will remain for future validation teams to use. On a second data validation pass through, the State could pull out much of the same code and use it with minimal modification. This initial investment in programming time need not be repeated in its entirety. Programming for future validations will not be cost free but should cost far less

Some further computer programming will be needed the second time validation is done. Extensive programming is required the first time data validation is implemented. However, much of this will be a one-time cost. Additional programming for the second round of data validation will only be needed to the extent that state systems or Federal reporting rules have changed. As one state administrator pointed out, they routinely make small changes to refine their data systems. So some additional programming is likely to update data validation computer programs in light of these changes.

However, if we were to allow as much as 15 percent of the initial programming time for these updates, the total time required to complete the entire data validation process (programming and validation) would still be reduced by about 65 percent.

All of these savings are generated by reductions in ADP time. There may not be parallel cost savings in the validation/review and report steps of data validation. Yes, if the same validator is around when the next validation is done, their experience with the initial validation should allow them to repeat the validation in less time. However, it is probably safer to allow for staff turnover and assume that the reviewer/validator activities will take almost as long the second time through.

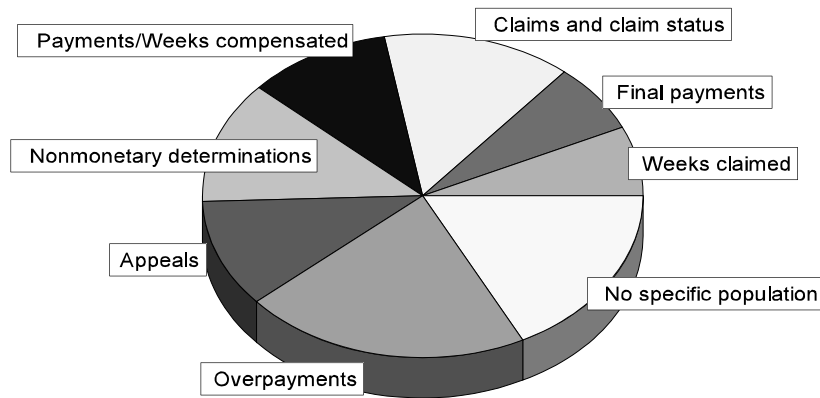
Time distribution across functions and analysis populations.

Chart 4 presents the average distribution of time across the reporting populations reviewed by benefits data validation. We will discuss them in a moment, but first it should be pointed out that the averages mask some large differences among States. Two examples will illustrate this. Massachusetts spent more than 400 hours for programming alone in their review of claims and claim status. Neither of the other two States spent even half that for their entire review of that population, including validation. As another example, Minnesota spent roughly a third of their benefits validation time on overpayments (798 hours). Neither of the other two States spent even a third as much on that population.

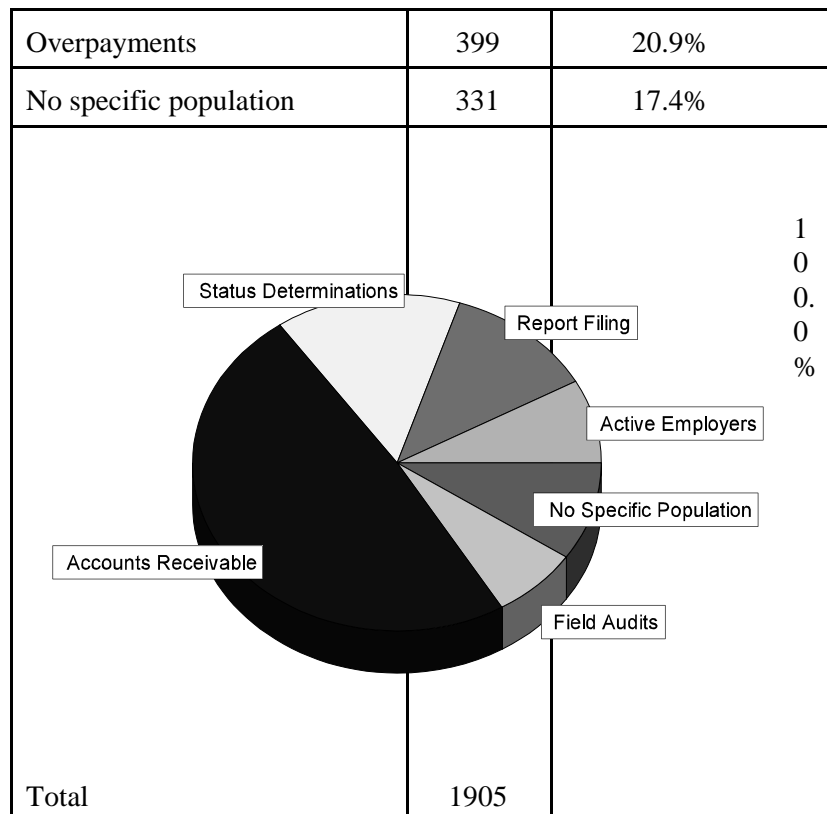
States will vary in the amount of time they spend on each population depending on a number of issues, including:

- Which populations they work on first, where they put in their practice time as they learn data validation;
- The quality and accessibility of the underlying data system that is generating both the report and the validation files; and
- Whether the programmer has recent experience and familiarity with the population.

**Chart 4:
Time
Distribut
ion
across
Benefits
Populati
ons**



	Average across States	
Population(s)	Hours	Percent of all hours
Weeks claimed	136	72.0%
Final payments	131	6.9%
Claims and claim status	267	14.0%
Payments/Weeks compensated	199	10.6%
Nonmonetary determinations	234	12.3%
Appeals	207	10.9%



Note: Massachusetts did not break out programmer time by population but did break out the validators time. Validators time was divided across the population groups.

The benefits work is spread widely across populations. Claims and claims status (14%) and overpayments (21%) represent the greatest share of time spent on data validation. However, as discussed, these large values each reflect unusually high time requirements in a single State.

Chart 5: Time Required by Tax Reporting Populations

Population(s)	Average Across States	
	Hours	Percent of all hours
Active Employers	182	8.3%
Report Filing	261	11.9%
Status determinations	321	14.6%
Accounts Receivable	1075	48.9%
Field Audits	155	7.0%
No specific population	203	9.2%
Total	2197	100.0%

Note: Massachusetts only validated field audits. For other populations averages are based only on the experience of two States.

The workload for tax validation is driven by the accounts receivable population. There are several reasons for this:

- The subpopulations in this area are more different from each other than are the subpopulations in other areas. For example balances at the end of a quarter are a point in time measure. On the other hand, amounts liquidated requires tracking and analysis of daily transactions occurring throughout the tax agency, transactions as different as audit collections and bankruptcy. In other populations, when programmers complete one subpopulation they have done most of the analysis necessary for the other subpopulations. In accounts receivable each subpopulation is almost like starting over.
- The population requires complicated tracking and accumulation of daily transactions.
- The reporting elements being validated are relatively new, so even programmers who are familiar with the tax data system are not necessarily conversant with the logic of accounts receivable as currently tracked on the ETA 581.

To summarize, this is a hard population to validate because the reporting requirement being validated is complicated. The complexity of the validation reflects the complexity of the underlying report.

Circumstances Affecting Time Requirements

The pilot test provided considerable information about where States will need to allocate staff resources when they conduct data validation. However, there were circumstances that affected the time it took to complete the work. Some increased the time required to complete the pilot while others decreased the time required. We briefly discuss some of these factors below. These factors are not necessarily important or common. However, States' validation resources may be impacted by these or other factors. There are always unexpected circumstances to deal with. For a fair presentation of time requirements we wanted to give you the information you need to put the numbers listed above into proper perspective.

Factors adding time to the pilot study:

Year two thousand computer issues

The pilot took place at a time when all States were devoting significant resources to resolving so-called “Y2K” problems in their computer systems. This work tended to make good ADP staff hard to come by. The shortage manifested itself differently in different States.

- There were times when the most skilled computer programmers were already busy on Y2K work and were not available to work on data validation.
- In one State Y2K issues increased the demand for good programmers everywhere. Several programmers who were working on data validation left for higher paying jobs at other organizations.
- ADP staff were busier than usual, with a large backlog of work. If there was a pause in the data validation project, programmers were pulled onto other projects. It was sometimes hard to get them back on the data validation project when planned. Time was lost when staff had to become familiar with data validation again after having been away and focused on other issues.

To be clear, no state said that Y2K problems themselves affected the development of data validation computer programs. The issue is one of the priorities. Until Y2K issues are resolved and the solutions well tested, this problem will remain the highest priority. Any other project, e.g. data validation, competing with it for resources will be hard pressed to demand the skilled staff necessary to proceed efficiently.

Older computer systems

As noted earlier, in one pilot State the staff felt the tax portion of the data validation system took longer to complete because the computer system they used was older and harder to manipulate. This suggests that States with older, less adaptable data systems may consume more time getting ready to do data validation.

Factors reducing the time required for the validation project:

Prior experience

Two States had done prior work on their data systems that gave them a leg up on data validation. Minnesota had done validation voluntarily a year earlier. North Carolina had completed a recent reassessment of their benefits data and reporting systems. In each case they went into the pilot with a firm grasp of benefits data issues. This meant that benefits work took less time relative to tax work than it might have otherwise. It also means that any State that has not performed a recent review of either tax or

benefit systems might need more time to complete data validation.⁶

B. Other Costs Considerations

There are several types of costs that will be faced by States as they begin data validation. The largest cost is staff time, a category we have discussed at length. Truth in advertising requires us to mention several other costs that States will encounter. None are as significant as staff expenditures, but they should be considered when data validation strategies are planned.

Time spent by State employees other than the validation team.

The project may require some time commitment from staff of the State (and federal) agency who are not among those assigned to work on data validation regularly. For example, during the visits contractors made to pilot States, the first meeting often filled a large conference room. In attendance were people in positions such as tax or benefits chief, head of data processing, and research director. These people were interested primarily in the broad issues: Are there any substantial findings, is the work on schedule, which staff will have to be available for the remaining work, and is data validation proceeding smoothly? These added individuals were not interested in details, and probably had no reason to be. In fact as soon as the discussion turned to details these people would typically suggest a rest break, a break from which they would never return. Though they were gone, they were numerous and had each put in a few hours of precious time.

Some States also had occasion to consult the front-line staff who enter and use the data. In any validation effort it is often useful to

⁶ Because of the way time was accounted for in the pilot study, the prior experience in Minnesota actually added time to the pilot. As we discussed earlier their pilot study reports included time from both the prior experience and the pilot study. But the point remains. Having worked on validation issues earlier, the benefits staff came to the pilot training grasping many key concepts, while the tax team was starting from scratch and had more learning to do during the course of the pilot.

ask a user about when they enter data, what decisions are involved, and how they use the information. Some effort from these staff may be required in future validation.

We would expect that similar time commitments would be part of a full national implementation of data validation. To anticipate what these time requirements would be, pilot States were asked to track the time spent by individuals who were not directly assigned to data validation, people such as agency managers, front-line service delivery staff and clerical support. To be honest States were not diligent about filling out tracking forms for the time spent by these individuals; therefore we do not have an accurate picture of this cost category.

However, the forms they submitted and discussions with these States suggest that some time will be required by managers and program staff. Certainly any State starting data validation should expect that some people other than the specific data validation team will need to invest their time. However, neither the forms nor discussions suggest that the time required was substantial.

Especially on tax, States got off to unproductive starts on the project. They began the project with too

few or too inexperienced programming staff. They allowed staff to get bogged down. Greater participation from managers and more rapid calls for technical assistance would have generated a quicker response to the problem and ultimately could have lowered the number of hours spent. The lesson from this is two-fold: (1) early and regular oversight by managers is critical, and (2) a more proactive technical assistance effort is needed to alleviate the problem of inefficient resource allocation.

Use of new software packages

States found that there were parts of the data validation project that could best be done using computer software that was different from what they used for regular unemployment insurance reports. States used statistical software packages, spreadsheets, data base packages and screen management software. This software was generally drawn upon at the end of the data processing pipeline, once data were extracted from the main data base. The software was used to analyze or present the information in a form needed for data validation.

Some of these applications were not used by ADP staff during their regular work duties. They had to add several days of time to (re)learn the software or to coordinate other staff who were experienced users of the application.⁷

Travel

Some travel will be required to attend training. In addition, most other data quality programs within unemployment insurance are addressed in workshops at national or regional unemployment insurance conferences. As with those other program, States may want to send staff to the occasional conference to exchange ideas with individuals managing data validation in other States.

V. Lessons on the Data Validation Process

The discussion thus far has focused on objective outcomes of the pilot test—what errors did data validation find and how long did it take. But the pilot also generated many practical lessons about the processes States will go through during data validation. The pilot State staff were generally experienced individuals who cared about what they were doing. Their insights, along with those of

⁷ Time spent learning or adapting these software applications is included in the time/cost figures discussed earlier. It is discussed here to alert States to an element of the project that can consume time. In addition, there were times when less reliance on new, and perhaps unnecessary, applications could have saved time on the project.

the evaluation contractors, were a source of valuable lessons on how data validation can best be designed and operated. The remainder of this report shares lessons learned about the process of conducting data validation. Five areas are discussed:

- Training,
- Technical assistance,
- The data validation handbook,
- The implementation process, and
- Staffing issues.

A. Training

Pilot States were trained on data validation in Washington, D.C. in November 1997. During a single week there were two training sessions. The first half of the week offered training on the validation of

unemployment insurance benefits reports; the second half focused on tax reports. In practice, there was separate training on tax and benefits. A small number of people stayed for both sessions, but once home almost all worked on either tax or benefits exclusively.

Whether tax or benefits, the training sessions had similar agendas. They covered:

- the history and importance of data validation in unemployment insurance;
- the core philosophy and practices of the data validation approach States would test in the pilot project;
- a review of each module, form and product of the data validation approach;
- the schedule of activities during the pilot project; and

- special requirements of the pilot study including detailed tracking of time spent, preparation of end-of-project reports, and planned visits to the States by contractors.

The style of the training was largely presentation—formal lecture combined with question and response. There were several hands-on exercises intended to expose participants to materials and work products they would use during the project. There were no separate sessions for ADP staff and data validators, though presenters attempted to point out topics that applied more to one group or the other. Sessions were lead by a combination of Department of Labor and contractor staff. Materials available to participants included state-specific data validation handbooks, copies of all slides used during training, and exercise materials.

Staff must have gone home wondering what they had got themselves into. First, we later found out that some of the staff had been volunteered for the project. These staff were not adequately briefed on the nature of the project. During the training they discovered for the first time that they were destined to begin a detail-oriented, comprehensive process that could not be managed casually. Second, the preparation for the training had taken longer than anticipated. This meant that, as the training began, some materials were not as well labeled as had been intended and some of the usual preparation by presenters had to be foregone. When this was recognized the contractors explored delaying the training for a short time to complete preparations, but State travel plans could not be changed easily.

The lesson learned is that for training to be effective it is essential to have a coordinated effort among members of the training time, and sufficient time must be allowed for careful preparation.

The presentation covered all aspects of the data validation process and States were able to conduct data validation when they returned home. But the sessions had some flaws. First, as

suggested above preparations were going on almost until the minute training began. This resulted in presentations and training materials that were less organized than is the usual practice of the contractors. Second, the pilot test was the first systematic fielding of the data validation process. Without that complete field experience there were few actual work products or data validation outputs to share with the States and for them to use as examples. In addition, it was not clear which pieces of information would be most important to the States as they began their validation activities. Thus the trainers tried to present all issues in this single session. As a result State staff sometimes became lost in details they were not ready to absorb.

The pilot test has solved some of the problems just mentioned. Pilot states produced many useful examples of validation work products. These materials will serve as illustrations during future training. Second, the technical assistance process during the pilot helped clarify points of emphasis for future training.

Recommendations for future training

At the end of the project States were asked to suggest key points for future training. They have now been through one round of training and, having applied that training can knowledgeably suggest refinements. The list below assembles the most reasonable recommendations of State and contractor staff.

- Conduct separate training for benefits and tax data validation. Avoid overlaps of the two sessions since some State staff will need to attend both.
- Help States prepare for training. In particular, work to assure that the people who will conduct data validation attend the training. Brief managers on the importance of training and the need to release staff to attend. Help them identify who should

attend.

- Use a variety of methods to conduct training—presentation, hands on exercises, and visual and verbal methodology.
- Include many exercises and samples of validation products so States can begin to translate technical discussions into a practical understanding of what they need to do.
- Do not try to cover all populations fully during training. This is too much detail to absorb in a single session. Stick to a single population and follow it through all validation steps so States can easily follow the logic.
- Especially as the validation rolls out, find ways to use States who have been through data validation to advise other States. It is often helpful for a new State to learn from a nearby State that has already implemented data validation. One State advises, however, that because they are not trainers, the presence of a training coordinator is essential.
- The training should offer guidance on practical administrative issues: staffing and skills requirements, the level of effort needed, how other agency functions will be affected/involved.
- Similarly, training should do more to help States develop a work plan. They need information about:
 - products that will be developed by ADP to prepare for validation,
 - forms they should complete,
 - scheduling and time commitments for the project, and
 - where to begin the process, which populations to address in which order.
- Some States suggested separating training for ADP staff and validators. The contractors strongly oppose this. It is important that, from the first day that the State staff encounter

data validation, they start working together as a team.⁸ However, there is general agreement that, at minimum, breakouts are needed for each of these groups. State staff can then hold discussions with others having similar responsibilities, and they can receive instruction on those tasks that shape their unique roles.

- One State suggests using the data validation handbook more during training, perhaps in lieu of a separate training guide. Their argument is that the handbook will be their main reference tool once they begin data validation. The training should begin to make them comfortable with the document. The contractors would agree this is valid comment, but also see the advantage of

separate training materials. The handbook is designed as a reference tool and thus does not have all the illustrations and explications needed in a training guide. Some balance is needed so trainers need not rely only on the handbook, but participants can begin to feel comfortable with the handbook as they go through training.

One State suggested having a short session to introduce the handbook and the general principles of validation. Then States could come back for a full session after thinking about or using what they learned in the first session. In principle this is a sound idea; in practice it may be difficult to schedule multiple training sessions.

B. Technical Assistance

Once States returned home they had access to a variety of technical assistance resources throughout the pilot project.

⁸ In some states there are individuals who participate both in programming and validation. They will benefit from training on both sets of activities, but would not want to sit through two full sessions to get this information.

- Benefits staff participated in regular conference calls with the contractor and each State received one visit from the technical assistance contractors. Site visits were an opportunity for contractors to review the State's work and to answer questions.
- Tax staff in each State were visited at least twice by technical assistance staff.
- Both tax and benefits staff were able to phone contractors any time they needed questions answered. Often e-mail and mail were used by States to ship materials to the contractor for review and comment.
- Department of Labor experts were available by telephone to answer questions on definitions and reporting requirements. They also participated in some of the site visits.

Both States and contractors found technical assistance helpful. To quote one State, "Technical assistance from both Mathematica and PRAMM was prompt and helpful."

The contractors understand that technical assistance is a critical extension of training, because the data validation approach is characterized both by broad coverage and much detailed work to validate each topic covered.

The level of detail in data validation has two implications. First, not all details can be covered in a single training session. Second, it will be hard for States to understand the practical requirements of the comprehensive system until they try to use what they learn from training and handbooks.

The key to technical assistance is engagement. Training will remain a theoretical exercise until States attempt to validate data. When they become engaged in the process they will learn what they know and what they do not know. They will begin to form substantive questions. At that point, technical assistance that provides intensive State-specific training becomes meaningful.

A formal technical assistance visit also engages technical assistance for the remainder of the project. Validators found that, in advance of a visit, calls to States to see how they were doing engendered minimal responses—“Everything is going well.” With a visit pending, State staff including managers began to prepare—assembling materials, writing out questions, thinking about what was and was not going well. Through this type of process States gain a better focus on how well the validation is preceding. In the pilot, once the technical assistance and State staff sat together in helpful consultation, States were much more likely to pick up the phone and call technical assistance staff when they had a question.

We recommend on-site, or at least regional, technical assistance as an integral part of the training strategy for any national implementation of data validation.

C. Handbook

The Data Validation handbook was the least well-received of all the components of the data validation system, but it did provide sufficient information for the States as they designed their validation products. This section reviews the problems States encountered; briefly discusses some points of history that led the handbook to its current form; and lists States’ recommendations for modifying the handbook.

Let’s start with a composite State validator whose reaction combines views we heard from several different State representatives.

“I read through the manual once. I did not understand it. The language was terse and technical, there were few examples, and it was not organized the way I planned to do the work. I read it again and I still was not sure what I was supposed to do. I read it a third time and it started to come together. As I

began using it to guide my work I came to understand what was wanted and found the handbook to be a very complete map and description of the work products I was preparing.”

Comments on the handbook differed considerably so no summary will match the views of every individual. However, if we had to characterize the prevailing view we would say the manual is complete and precise but somewhat inaccessible.

Why is the manual so difficult for State staff to absorb initially? There are perhaps, two driving reasons. First, a primary strength of this data validation approach is the attention to detail. It goes beyond general principles of validation and lays out exactly what States are expected to do to complete the validation process—what data to use, how to test their accuracy, when to capture data, how to present it, what tests to conduct to check its validity. A key feature is that it even identifies the exact data elements that should be used from each State’s data system. To be comprehensive, this detail must be maintained across dozens of tax and benefits measures.

Inevitably, a handbook focusing on this level of detail will be lengthy. Department of Labor coordinators for the design project, in conjunction with the contractor design team, set a priority of keeping the manual relatively short so it would not intimidate new users. Even with this constraint, the manuals are very thick. The handbook design approach was to pair concise explanatory text with lengthier technical appendices. So a trade-off was made, sacrificing some explanation and examples for brevity.

Another result of the attempt to be detailed and precise was that the authors of the manual attempted to avoid words that might be misinterpreted because the term had an existing, more generic meaning. The authors developed new terms and acronyms which they could give precise meaning—an assurance that the meaning

would not be confused with any other interpretation readers brought with them from a prior use of the term. Here clarity and precision was obtained, but perhaps with the trade-off that the terminology is new and takes time to learn. It should be noted that by the end of the pilot, state staff adopted the terminology and used it comfortably as their own.

The second historical factor that produced the current form of the handbook is that when it was originally designed it was both an instructional and a reference tool. The style of these two types of guidebooks is often different. Instructional materials are aimed at new users and may dispense with some detail to focus on general principles, illustrative examples, and discussion of common questions. In reference tools it is assumed most of this information is known to the experienced user. Lengthy explanations are eliminated because readers often want to look up a single detail they have forgotten without wading through extensive narrative. The authors and their clients at DOL knew that while walking the line between instructional guide and reference manual the compromises would leave some users dissatisfied. This compromise was necessary.

Before presenting some suggestions for revising the manuals it is important to point out several implications of the discussion above:

- Any revisions need to be made before training is done. Particularly, when talking about terminology, precision is important. If new, more intuitive, terms are to be used, they need to be selected before most States start doing data validation, and then not changed.⁹

⁹ New terms would need to be vetted by DOL and some States as in fact being better than the current terms. Much discussion and debate has already focused on terms.

- In a document of this length and precision, most substantive revisions will require considerable effort to implement. Some problems can be addressed inexpensively by including checklists, timetables and other guidance that can be used as an overlay to the manuals without changing core text. But these overlays add to the length of the handbook and only go so far in resolving concerns.
- With extensive training and technical assistance provided elsewhere, the handbook can more reasonably revert to a reference tool, a use for which it is better suited.

Recommendations for handbook revision

Following are the most common or reasonable recommendations of pilot State staff and evaluators for refining the handbook. Remember that any major revisions to the manual could be both time consuming and costly. Because these suggestions can be costly to implement, we include discussions that attempt to clarify costs and conflict for some items.

- ***Include more examples of products such as reconstruction files and spreadsheets.***

One individual went so far as to suggest including examples from every subpopulation. As a result of the pilot study there are many examples available of actual products of the validation. Adding examples would increase the length of the document but does not require any substantial rewriting.

- ***Use less technical, less terse language.***

Since the primary complaint about the handbook is its inaccessibility this suggestion should be given serious consideration. Recognize however, that this is essentially a call for a thorough rewrite and, perhaps, reorganization of the handbook. Such a revision would be time consuming and would need to be completed before other modifications.

- ***Provide a clear listing of all deliverables, products and timetables.***

This is a reasonable request, one that does not require extensive rewriting of the handbook.

- ***Include a section of suggestions and helpful hints. Users need more guidance on the order of the steps the validator needs to follow.***

This is another refinement that could help the State staff without major rewriting. Appendix A to this report gives one example of an effort by a pilot States to clarify the steps and timing of the validation.

- ***Have separate sections or checklists for programmers and validators.***
- ***Different programmers will be responsible for different populations. It would be nice to be able to hand a person a population-specific stack of materials—all the general overview materials paired with the technical text only for that population.***

These appear to be valid suggestions in that they link the handbook to the way work is done. However, it should be noted that the two positions argue for different organizing principles for the handbook (one by type of staff and one by area being validated).

Perhaps they could be handled with checklists that briefly list the tasks to attend to when playing a particular role in the validation or when working on a single population. One form of a checklist could identify pages that should be included for someone working on a single population. States could then put together appropriate reference packages depending upon how they organized their work. Such pull out segments would be

more easy to develop if the handbook were single-sided, but this would add to the appearance of bulk.

There are two potential impacts of the handbook's great detail. First, validators may need some help organizing their work. Second, it can be easy to miss details. One State was well into the work on a population before they realized they had missed one step. Additional guidance could help with both of these counts.

- ***Add an index***

An index is always helpful in a reference guide. In this case creating an index is time consuming both to create and to maintain as the core manual is modified. However, it may be worthwhile if it makes the tool more useful to States.

It should be pointed out that the handbook already has an internal index, although it is not identified as such. Experienced users of the handbook will generally work back from its Appendix A. This appendix lists the data to be extracted for each population and specifies how those data should be listed. The Appendix lists "steps" for each data element used in the appendix. Each step refers the user to a particular page of the handbook that lists the definitions and data base location for that data element. This extensive cross-referencing may already serve many of the purposes of an index.

- ***Revise the spreadsheets***

The spreadsheets were implemented for the first time during the pilot study. Some minor refinements were identified. Some calculations were incorrect. Those calculations have now been corrected and used for calculations in this final report. The spreadsheets were not formatted in a manner that clearly highlighted key findings. This problem could be addressed with some reorganization and labeling that is

straightforward but time consuming.

Spreadsheets should be integrated into the Federal reporting system. First, the appearance of the forms should be similar to the reports being validated to make it clear from which report cells the information is drawn. Second, the spreadsheets should become official reports on the outcomes of data validation.

- ***Make sure definitions in the handbooks match the official reporting instructions.***

Some State staff felt the two sets of definitions were not always compatible. It is important that both sets of definitions match. The larger issue is that handbook updates will need to be issued when federal definitions change.

- ***Include Questions and Answers as an update to the manual.***

This is a practical mechanism to clarify the handbook without major rewrites and without replacing dozens of handbooks that have been sent to the States.

Two concluding points should be made regarding the modifications to the handbook. First, several of the suggestions mentioned above have already been implemented. Examples are addition of an index, lists of tasks by staff function, and refinement of spreadsheets.

Second, the current version of the handbook is the end product of a long consensus building process. It reflects comments from all states and from a variety of knowledgeable Unemployment Insurance Service representatives. Care should be taken that changes requested by participants in the current study do not inappropriately over-ride the preferences of individuals whose comments contributed to the initial consensus.

D. The Implementation Process

This evaluation report does not propose to redesign the process for conducting the data validation. Nor does it propose a revised schedule of activities. The validation process gives States considerable autonomy to approach the validation in the order they find most convenient and the pilot demonstrated no compelling reason to mandate a change in that policy. However, there were lessons learned that may guide States as they decide how to use their autonomy.

- *Begin validation by working through the analysis of one of the more straightforward populations, then move directly to the most time consuming populations.*

Beginning with a simple population allows States to use the validation methodology in a relatively uncomplicated context. With this preparation in hand they can attack the remainder of their validation work with a solid grounding in the core data validation methodology.

However, once this is done it is important to get to work on the most difficult populations to analyze. States had a tendency to put off the more complicated work until last. They then found themselves up against the deadline for completing validation with much time-consuming work left to do. Had they started earlier on the most challenging populations they would have better understood what would be difficult and sought technical assistance sooner.

The States agreed that the populations to begin with were population 1 (active employers) in tax and populations 1 (weeks claimed) or 2 (final payments) for benefits.¹⁰

¹⁰ Although these populations are the first States will work on, they not necessarily the populations from which training examples will be drawn. For example, in tax training examples should come from populations 2 or 3. Training on these populations will address all issues that are found in population 1, while introducing some additional complexities which State staff should understand during training.

The most difficult population in tax was clearly number 4 (accounts receivable). For benefits, the determination of which population was most difficult varied by State. However, population 3 (claims) and populations 12-14 (overpayments) were among those mentioned by States as the most difficult.

- ***Understand that the process of preparing data validation files is iterative.***

Some of the State validation files were incorrect when they were first run by the data processing staff. The programming process was characterized by several rounds of design, test, and revision before the final version was arrived at. A file would be produced. Someone would say it did not look right. Another version would be produced to correct any problems identified. The process continued until the validation files looked correct. Review was offered by ADP staff of their own work, ADP supervisors, managers of units whose work was being described in the reported numbers, validators and outside contractors.

This is important for two reasons. First, States should recognize that several rounds of programming may be required in the first year of validation and plan accordingly. Second, we strongly recommend that the end user, primarily the validator, begin to review the ADP products as soon as possible. Having a second set of eyes from the start will increase the chances of identifying and correcting problems with fewer iterations. The review process will be especially important during the first year of data validation when materials are being developed and tested for the first time.

- ***Treat the staff who are conducting validation as a single***

team, rather than as separate units who pass the project along from one to another.

It is advisable to have meetings regularly among programmers, validators and managers. These meetings should not last long because time is at a premium. But it is important to coordinate schedules if the team is to work as efficiently as possible. It also helps to get many knowledgeable heads together while trying to understand a new program such as data validation.

- *Write down what staff did to complete data validation.*

Most of the learning required to implement data validation has little to do with federal handbooks or procedures. Most of the thought States went through in the pilot was understanding how to get information off their own data systems and how to assemble those data for validation. Of this State-specific information only the data elements are saved in the data validation handbook. States should also preserve the documentation for the data validation software, as well as the steps followed by the validators.

One State programmer said that, with the number of details to manage in this project, he would have a hard time remembering where he was if only a couple days passed. He kept notes to refresh his memory. The notes will be a guide if someone else is responsible for data validation in the future, or if he is responsible for a second round of data validation in two to four years. Without the notes, it would be like starting at square two.

The State would not have to go back to square one because some computer programs will remain available for use in future rounds of data validation. However, software is really only viable if it is documented well enough that another person can use it and modify it if necessary. Again, documenting the programming is critical.

E. Staffing Issues

States had several useful recommendations regarding who should be assigned to work on data validation.

- ***Use staff who know the business, who understand unemployment insurance.***

Programming skills are not enough. Successful completion of this project requires staff who know where the data come from and how they are used. Pilot States found it helpful to use staff who were very familiar with the State data systems. They needed both to be good programmers and to understand how data was used by the agency. If such people do not have the time to do programming themselves it is essential that they at least set the specifications for programming and review work products.

- ***Use experienced programmers.***

When States used inexperienced programmers they inevitably ended up redoing some of their work. It is more efficient and less aggravating to get it right the first time.

- ***Have the staff work as teams.***

Every State ended up using teams of programmers, even though they sometimes started with one individual. There is too much work for one person to manage. It also helps if staff, both ADP and validators, can bounce ideas off each other as they attempt to understand the data validation system.

F. Summary

This report has presented an analysis of a data validation methodology that was tested in three States. Those states found the approach to be fair and efficient. Moreover, evidence suggests that a validation system is needed. There is an increasing reliance on performance measures throughout the unemployment insurance system, and there remain data problems that need resolution before the reports that underlie the performance system are fully accurate.

Establishing a comprehensive data validation system will require a substantial investment of State staff time, especially for necessary computer programming, but also for validation and management. Once the system is implemented much of the computer programs will be usable in the same form for data validation in future years. Thus the maintenance of the ongoing validation system should be far less costly than the initial implementation. An investment in responsive technical assistance should reduce State costs further, especially during the start-up period.

As the three pilot States conducted the test of the validation approach, many lessons were learned about how best to prepare for and operate the processes. Those lessons, also discussed in this report, should make it easier for other States to prepare for and operate the data validation process.

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